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EXAMINER

BAYOU, AMENE SETEGNE

ART UNIT

PAPER NUMBER

3746

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DELIVERY MODE

09/16/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/586,872

Applicant(s)

RODRIGUEZ-AMAYA ET AL.

Examiner

AMENE S. BAYOU

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
4a) Of the above claim(s) 1-8 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 9-27 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 21 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 07/21/2006
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 9-14, 22-24, 26 are rejected under 35 U.S.C 103(a) as being unpatentable over Guentert et al. (US patent number 6332761) in view of Cooper et al. (US patent number 5715996).
3. In re claim 9 Guentert et al. '761 disclose a high pressure fuel pump including:
 - In a high-pressure pump ,in figure 1 and 2,for a fuel injection system of an internal combustion engine (column 3,lines 19-21) , having at least one pump element which has a pump piston (12) driven in a reciprocating motion and defining a pump work chamber (18) , into which work chamber fuel is aspirated from a fuel inlet via an inlet valve (48) in the intake stroke of the pump piston (12) and from which work chamber (18) fuel is positively displaced via an outlet valve (68) into a high-pressure region in the pumping stroke of the pump piston (12), and the inlet valve (48) and/or the outlet valve (68) having a valve member (52,78) , which with a sealing face cooperates with a valve seat (54,76) disposed in a valve housing, and by means of the valve member (52,78) in the opened state, when the valve member (52,78) with its sealing face has lifted from the

valve seat (54,76) opens a flow cross section between the valve member (52,78) and the valve housing.

But Guentert et al. '761 fail to disclose:

- In the opened state of the valve member, a region having the smallest flow cross section between the valve member and the valve housing is located downstream, in the flow direction of the fuel flowing through the valve, of the sealing face of the valve member.

However, Cooper et al.'996 teach a fuel injection nozzle including:

- In the opened state of the valve member (38) , a region having the smallest flow cross section between the valve member (38) and the valve housing (28) is located downstream, in the flow direction of the fuel flowing through the valve, of the sealing face (52) of the valve member (38), in figures 4A-4C and column 3, lines 2-21.

4. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the fuel pump of Guentert et al. '761 by including a flow restriction area downstream of the valve seat face as taught by Cooper et al.'996 in order to increase the force applied on the valve by the drag that will be generated. Please note that Cooper et al.'996 used practically the same solution to the same problem stated by the applicant.

5. In re claim 10 Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 9 disclose the claimed invention:

Art Unit: 3746

Cooper et al.'996 disclose:

- The valve housing (28) comprises a first jacket face (52), inclined relative to the longitudinal axis (31) of the high-pressure pump and surrounding the valve member (38), which jacket (52) face forms the valve seat (32), and a second jacket face (54), adjoining the first jacket face (52) and inclined relative to its longitudinal axis (31) and surrounding the valve member (38) that the angle of inclination of the second jacket face (54) relative to the longitudinal axis (31) being less than the angle of inclination of the first jacket face (52), the region of the smallest flow cross section being located between the valve member (38) and the second jacket (54) face of the valve housing (28) in the opened state of the valve member, in figures 4A-4C and column 3, lines 2-21.

6. In re claim 11 Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 10 disclose the claimed invention:

Cooper et al.'996 disclose:

- The first jacket face (52) and/or the second jacket face (54) of the valve housing (28) is embodied at least approximately frustoconically, in figures 4A-4C.

7. In re claim 12 Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 9 disclose the claimed invention:

Cooper et al.'996 disclose:

- The sealing face of the valve member (38) is embodied at least approximately frustoconically and is inclined to the longitudinal axis (31) of the first jacket face

(52) preferably by a different angle from the angle by which the first jacket face (52) of the valve housing is inclined relative to its longitudinal axis (31). Please note that since valve member 38 is a ball its sealing face (the face corresponding to valve seat surface 32) is a curvature and definitely has a different angle of inclination with respect of axis 31.

8. In re claim 13 Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 10 disclose the claimed invention:

Cooper et al.'996 disclose:

- The sealing face of the valve member (38) is embodied at least approximately frustoconically and is inclined to the longitudinal axis (31) of the first jacket face (52) preferably by a different angle from the angle by which the first jacket face (52) of the valve housing is inclined relative to its longitudinal axis (31). Please note that since valve member 38 is a ball its sealing face (the face corresponding to valve seat surface 32) is a curvature and definitely has a different angle of inclination with respect of axis 31.

9. In re claim 14 Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 10 disclose the claimed invention:

Cooper et al.'996 disclose:

- The sealing face of the valve member (38) is embodied at least approximately frustoconically and is inclined to the longitudinal axis (31) of the first jacket face (52) preferably by a different angle from the angle by which the first jacket face (52) of the valve housing is inclined relative to its longitudinal axis (31). Please

note that since valve member 38 is a ball its sealing face (the face corresponding to valve seat surface 32) is a curvature and definitely has a different angle of inclination with respect of axis 31.

10. In re claim 22 Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 9 disclose the claimed invention:

Cooper et al.'996 disclose:

- The valve member (38) is embodied at least approximately spherically; and wherein the sealing face (the face corresponding seat 32,52) is formed by a region of the surface of the valve member (38),in figure 4A-4C.

11. In re claim 23 Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 10 disclose the claimed invention:

Cooper et al.'996 disclose:

- The valve member (38) is embodied at least approximately spherically; and wherein the sealing face (the face corresponding seat 32,52) is formed by a region of the surface of the valve member (38),in figure 4A-4C.

12. In re claim 24 Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 11 disclose the claimed invention:

Cooper et al.'996 disclose:

- The valve member (38) is embodied at least approximately spherically; and wherein the sealing face (the face corresponding seat 32,52) is formed by a region of the surface of the valve member (38),in figure 4A-4C.

13. In re claim 26 Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 9 disclose the claimed invention:

Cooper et al.'996 disclose:

- A higher static pressure prevails than in the region of the smallest flow cross section; in the opened state of the valve member (38) in the region of its sealing face (32,52) and wherein as a result of the pressure acting on the sealing face, a force in the opening direction on the valve member is generated, in column 3, lines 2-21

14. Claims 15-17,25,27 are rejected under 35 U.S.C 103(a) as being unpatentable over Guentert et al. '761 in view of Cooper et al.'996 as applied to claim 9 further in view of Graner et al.(US patent number 5056754).

15. In re claim 15 Guentert et al. '761 in view of Cooper et al.'996 disclose the claimed invention except:

- An undercut at the transition between the first jacket face and the second jacket face of the valve housing, the undercut having a jacket face extending at least approximately parallel to the longitudinal axis.

However Graner et al. '754 teach a fuel injection valve including:

- An undercut (63) at the transition between the first jacket face (61) and the second jacket face (62) of the valve housing (5), the undercut (63) having a jacket face extending at least approximately parallel to the longitudinal axis, in figure 8 and column 10, lines 14-18.

16. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified fuel pump of Guentert et al. '761 and Cooper et al.'996 by including undercuts at the transition point where the inclined surfaces of the valve housing meet, as taught by Graner et al. 754 in order to give a good support to the valve when resting on the valve housing and thereby get good sealing.

17. In re claim 16 Guentert et al. '761 in view of Cooper et al.'996 further in view of Graner et al. 754 disclose the claimed invention:

Graner et al. 754 disclose:

- An undercut (63) at the transition between the first jacket face (61) and the second jacket face (62) of the valve housing (5), the undercut (63) having a jacket face extending at least approximately parallel to the longitudinal axis, in figure 8 and column 10, lines 14-18.

18. In re claim 17 Guentert et al. '761 in view of Cooper et al.'996 further in view of Graner et al. 754 disclose the claimed invention:

Graner et al. 754 disclose:

- An undercut (63) at the transition between the first jacket face (61) and the second jacket face (62) of the valve housing (5), the undercut (63) having a jacket face extending at least approximately parallel to the longitudinal axis, in figure 8 and column 10, lines 14-18.

19. In re claim 25 Guentert et al. '761 in view of Cooper et al.'996 further in view of Graner et al. 754 disclose the claimed invention:

Cooper et al.'996 disclose:

- The valve member (38) is embodied at least approximately spherically; and wherein the sealing face (the face corresponding seat 32,52) is formed by a region of the surface of the valve member (38),in figure 4A-4C.

20. In re claim 27 Guentert et al. '761 in view of Cooper et al.'996 further in view of Graner et al. 754 disclose the claimed invention:

Cooper et al.'996 disclose:

- A higher static pressure prevails than in the region of the smallest flow cross section; in the opened state of the valve member (38) in the region of its sealing face (32,52) and wherein as a result of the pressure acting on the sealing face, a force in the opening direction on the valve member is generated, in column 3,lines 2-21

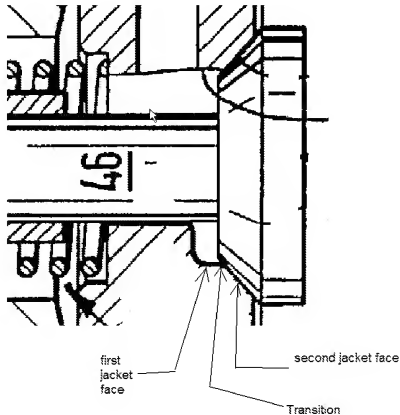
21. Claims 18,19,20, are rejected under 35 U.S.C 103(a) as being unpatentable over Guentert et al. '761 in view of Cooper et al.'996 as applied to claims 10 ,13 and 14 respectively further in view of Katzer et al. (US patent number 3735777).

22. In re claim 18 Guentert et al. '761 in view of Cooper et al.'996 disclose the claimed invention:

Guentert et al. '761 disclose:

Art Unit: 3746

- The valve member (52) ,in figure 2,comprises a shaft (46) and a head of enlarged cross section compared to the shaft (46) , the sealing face (54) being located on the valve member, and a region (that part where the shaft and the valve head meet) on the head of the valve member (52) having a cross section that is reduced compared to the rest of the cross section of the head, which region faces the transition between the first jacket face (and the second jacket face in the valve housing (marked for clarity in figure below).



But Guentert et al. '761 in view of Cooper et al.'996 fail to disclose:

- The sealing face is located at the transition between the shaft and a head.

However Katzer et al.'777 teaches an automatic valve including:

- The sealing face (tapering face 26) is located at the transition between the shaft (28) and a head (26), in figure 3.

23. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified valve of Guentert et al. '761 and Cooper et al.'996 by making the sealing face located at the transition between the shaft and the valve head as taught by Katzer et al.'777 for ease of manufacturing (no extra machining required to reduce the size of the shaft).

24. In re claim 19 Guentert et al. '761 in view of Cooper et al.'996 further in view of Katzer et al.'777 disclose the claimed invention:

Guentert et al. '761 disclose:

- The valve member (52) ,in figure 2,comprises a shaft (46) and a head of enlarged cross section compared to the shaft (46) , the sealing face (54) being located on the valve member, and a region (that part where the shaft and the valve head meet) on the head of the valve member (52) having a cross section that is reduced compared to the rest of the cross section of the head, which region faces the transition between the first jacket face (and the second jacket face in the valve housing (marked for clarity in figure above).

Katzer et al.'777 disclose:

- The sealing face (tapering face 26) is located at the transition between the shaft (28) and a head (26), in figure 3.

25. In re claim 20 Guentert et al. '761 in view of Cooper et al.'996 further in view of Katzer et al.'777 disclose the claimed invention:

Guentert et al. '761 disclose:

- The valve member (52) ,in figure 2, comprises a shaft (46) and a head of enlarged cross section compared to the shaft (46) , the sealing face (54) being located on the valve member, and a region (that part where the shaft and the valve head meet) on the head of the valve member (52) having a cross section that is reduced compared to the rest of the cross section of the head, which region faces the transition between the first jacket face (and the second jacket face in the valve housing (marked for clarity in figure above).

Katzer et al.'777 disclose:

- The sealing face (tapering face 26) is located at the transition between the shaft (28) and a head (26), in figure 3.

26. Claim 21 is rejected under 35 U.S.C 103(a) as being unpatentable over Guentert et al. '761 in view of Cooper et al.'996 and Graner et al. '754 as applied to claim 15 further in view of Katzer et al.'777.

27. In re claim 21 Guentert et al. '761 in view of Cooper et al.'996 further in view of Graner et al. '754 disclose the claimed invention:

Guentert et al. '761 disclose:

- The valve member (52) ,in figure 2,comprises a shaft (46) and a head of enlarged cross section compared to the shaft (46) , the sealing face (54) being located on the valve member, and a region (that part where the shaft and the valve head meet) on the head of the valve member (52) having a cross section that is reduced compared to the rest of the cross section of the head, which region faces the transition between the first jacket face (and the second jacket face in the valve housing (marked for clarity in figure above).

But Guentert et al. '761 in view of Cooper et al.'996 and Graner et al. '754 fail to disclose:

- The sealing face is located at the transition between the shaft and a head.

However Katzer et al.'777 teach an automatic valve including:

- The sealing face (tapering face 26) is located at the transition between the shaft (28) and a head (26), in figure 3.

28. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified valve of Guentert et al. '761 and Cooper et al.'996 and Graner et al. '754 by making the sealing face located at the transition between the shaft and the valve head as taught by Katzer et al.'777 for ease of manufacturing (no extra machining required to reduce the size of the shaft).

Conclusion

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amene S. Bayou whose telephone number is 571-270-3214. The examiner can normally be reached on Monday-Thursday, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Charles G Freay/
Primary Examiner, Art Unit 3746

Amene S Bayou
Examiner
Art Unit 3746